

What Is Claimed Is:

1 1. A transflective liquid crystal display device,
2 comprising:

3 a display panel having a viewing area, wherein the viewing
4 area comprises a transmissive region and a
5 reflective region;

6 a backlight device disposed under the display panel,
7 wherein the backlight device provides a backlight
8 passing through the transmissive region;

9 a power management controller connected with the
10 backlight device, wherein the power management
11 controller controls an intensity of the backlight;
12 and

13 at least one photodetector located on the display panel
14 outside the viewing area, wherein the photodetector
15 detects an intensity of ambient light around the
16 display panel, and then provides a corresponding
17 signal to the power management controller to control
18 the intensity of the backlight;

19 wherein, by the power management controller based on the
20 corresponding signal, the intensity of the
21 backlight automatically becomes greater when the
22 intensity of the ambient light becomes lower, and
23 the intensity of the backlight automatically
24 becomes lower when the intensity of the ambient
25 light becomes greater.

1 2. The transflective LCD device according to claim 1,
2 wherein the display panel comprises:

3 a first substrate located above the backlight device;
4 a pixel electrode having a transparent portion and an
5 opaque portion formed on the first substrate,
6 wherein the transparent portion of the pixel
7 electrode is in the transmissive region and the
8 opaque portion of the pixel electrode is in the
9 reflective region;
10 a second substrate opposite the first substrate; and
11 a liquid crystal layer interposed between the first and
12 the second substrates.

1 3. The transflective LCD device according to claim 1,
2 wherein the backlight device comprises a cold cathode
3 fluorescent tube (CCFL) or a light emitting diode (LED).

1 4. The transflective LCD device according to claim 1,
2 wherein the photodetector is a photosensitive resistor or a
3 photodiode.

1 5. The transflective LCD device according to claim 2,
2 wherein the first substrate is a glass substrate.

1 6. The transflective LCD device according to claim 2,
2 wherein the second substrate is a glass substrate.

1 7. The transflective LCD device according to claim 2,
2 wherein the transparent portion of the pixel electrode is an
3 ITO (indium tin oxide) layer or an IZO (indium zinc oxide)
4 layer.

1 8. The transflective LCD device according to claim 2,
2 wherein the opaque portion of the pixel electrode is an aluminum
3 layer or a silver layer.

1 9. A method of fabricating a transflective liquid
2 crystal display device, comprising the steps of:

3 providing a first substrate having a viewing area and a
4 peripheral area, wherein the viewing area comprises
5 a transmissive region and a reflective region;

6 disposing a backlight device under the first substrate,
7 wherein the backlight device provides a backlight
8 passing through the transmissive region;

9 providing a power management controller connected with
10 the backlight device, wherein the power management
11 controller controls an intensity of the backlight;
12 and

13 forming at least one photodetector on the first substrate
14 in the peripheral area, wherein the photodetector
15 detects an intensity of ambient light above the
16 first substrate, and then provides a corresponding
17 signal to the power management controller to control
18 the intensity of the backlight;

19 wherein, by the power management controller based on the
20 corresponding signal, the intensity of the
21 backlight automatically becomes greater when the
22 intensity of the ambient light becomes lower, and
23 the intensity of the backlight automatically
24 becomes lower when the intensity of the ambient
25 light becomes greater.

1 10. The method according to claim 9, further comprising
2 the steps of:

3 forming a pixel electrode having a transparent portion and
4 an opaque portion on the first substrate, wherein

the transparent portion of the pixel electrode is located in the transmissive region and the opaque portion of the pixel electrode is located in the reflective region;

providing a second substrate opposite the first substrate; and

filling a space between the first substrate and the second substrate with liquid crystal molecules to form a liquid crystal layer.

11. The method according to claim 10, further comprising the steps of:

forming a thin film transistor array on the first substrate, wherein thin film transistors electrically connect the pixel electrode.

12. The method according to claim 10, wherein the transparent portion of the pixel electrode is an ITO (indium tin oxide) layer or an IZO (indium zinc oxide) layer.

13. The method according to claim 10, wherein the opaque portion of the pixel electrode is an aluminum layer or a silver layer.

14. A method of fabricating a transflective liquid crystal display device, comprising the steps of:

providing a first substrate having a viewing area and a peripheral area;

forming a metal layer on part of the first substrate in both the viewing and the peripheral areas, wherein the metal layer in the viewing area serves as a gate;

forming a gate insulating layer on the gate;

9 forming a semiconductor layer on the gate and the metal
10 layer in the peripheral area;
11 forming a source electrode and a drain electrode on part
12 of the semiconductor layer on the gate insulating
13 layer;
14 blanketly forming an insulating layer over the first
15 substrate;
16 forming a first opening and a second opening penetrating
17 the insulating layer, wherein the first opening
18 exposes the drain electrode and the second opening
19 exposes the semiconductor layer in the peripheral
20 area;
21 forming a transparent conductive layer in the second
22 opening and the first opening, extending to part of
23 the insulating layer;
24 forming a reflective layer on part of the insulating
25 layer;
26 disposing a backlight device under the first substrate,
27 wherein the backlight device provides a backlight
28 passing through the transparent conductive layer
29 extends to part of the insulating layer; and
30 providing a power management controller connected with
31 the backlight device, wherein the power management
32 controller controls an intensity of the backlight;
33 wherein a photodetector consists of the metal layer, the
34 semiconductor layer and the transparent conductive
35 layer in the peripheral area, and the photodetector
36 detects an intensity of ambient light above the
37 first substrate, and then provides a corresponding

38 signal to the power management controller to control
39 the intensity of the backlight;
40 wherein, by the power management controller based on the
41 corresponding signal, the intensity of the
42 backlight automatically becomes greater when the
43 intensity of the ambient light becomes lower, and
44 the intensity of the backlight automatically
45 becomes lower when the intensity of the ambient
46 light becomes greater.

1 15. The method according to claim 14, further comprising
2 the steps of:
3 providing a second substrate opposite the first
4 substrate; and
5 filling a space between the first substrate and the second
6 substrate with liquid crystal molecules to form a
7 liquid crystal layer.

1 16. The method according to claim 15, wherein the first
2 substrate and the second substrate are glass substrates.

1 17. The method according to claim 14, wherein the metal
2 layer is an Al layer.

1 18. The method according to claim 14, wherein the
2 insulating layer is a SiO₂ layer.

1 19. The method according to claim 14, wherein the
2 transparent conductive layer is an ITO (indium tin oxide) layer
3 or an IZO (indium zinc oxide) layer.

1 20. The method according to claim 14, wherein the
2 reflective layer is an aluminum layer or a silver layer.